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The university-industry cooperation and its practical application in the Czech Republic

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Abstract

The aim of this paper is to present the advantages and limitations of university- industry cooperation . This issue is currently very important because of the employability of university graduates in the future. Hence the interest in mutual cooperation of universities and companies. The article presents the results of an empirical research carried out from two perspectives. The former focuses on the interest of students in employment in economic and management professions, the latter presents the results of a survey looking into the interest in cooperation between the branches of multinational companies and universities engaged in tertiary education in the Czech Republic. The results indicate students' interest in their active involvement in the practice itself during college, and lower interest in cooperation with universities shown by branches of multinational companies in the Czech Republic in particular .

Keywords:Tertiary education; cooperation; practice; students

1. Introduction

The contemporary educational system is based on the participation of more actors involved in the education policies that have a direct impact on the way and the chosen method of educational process. Several groups of actors in education policy can be distinguished: elected politicians, school administration, teachers and their organizations, parents and their associations, students, churches,

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employers and educational experts (Kalous, 1997). They differ not only in the interests they represent, but also in their access to resources (financial and information), in the number of contacts or in the extent of influence they have on decision-making. (Hloušková, 2006). Needs of the participation of teachers with professional sphere, i.e. theorists and professionals were discussed in *Practical Education* (1798), where the authors first mentioned the importance of using a real example to complete the theoretical concept, which leads to a higher perception of shared phenomenon (Edgeworth & Richardson, 1994).

Another important book dealing with the need of the synthesis of theoretical and practical concept of education was written by the John Dewey (1938), a critic of the traditional concept of education. Also the state officials of the European Union are well aware of the importance of practical education in the tertiary sector – that is research and development. Practical training at university level is supported by the Operational Programme Education for Competitiveness, which is co-financed by the European Social Fund and the state budget of the Czech Republic. (Source: European Social Fund).

This program gives rise to projects aiming to promote practical education at universities and colleges.

The need for practical application of theoretical concepts is apparent in all areas of education. Nowadays, its importance is increasing particularly at universities supported by application practice in companies and public and state administration institutions.

Ideally, practical training should mean mutual use of knowledge and skills of both companies, students and university teachers. Research and development, provides universities with access to new knowledge, with the possibility of its practical applications. On the other hand, the application sphere should participate in education and train more practical oriented employees. Benefits can thus be found on both sides of the participating actors.

Given the potential benefits, the cooperation between universities and practice, represented by subsidiaries of multinational companies is observed.

This may represent an interesting view on the development of mutual cooperation for the economy in the post-transition period, where the Czech Republic can be included. Suggestions of the Ministry of Education regarding the future of science and research, define the current troubled state of cooperation between universities and the business community represented mainly by companies. An obstacle is defined as a condition where the infrastructure for knowledge transfer from public research to practice does not exists. Agreements on cooperation between universities and industry are largely formal. In view of these facts, it is important to identify the interest of cooperation

between universities and the application area and the corresponding adjustment of assistance (source: Ministry of Education, Youth and Sports, 2012).

2. Methodology

Description and processed results of internship implementation into the syllabus are based on the information from Masaryk University, Faculty of Economics and Administration, which serves as an example for the presentation of the issue. The information covers the period between 2006-2012. The results are evaluated by the graphic display. The sample of students represents about 10% of the students in one year.
The issue of cooperation between universities and their practical application was dealt with using methods of qualitative and quantitative research, the sample of 335 subsidiaries of multinational companies operating in the Czech Republic (Blažek et al., 2011).

Answers in the questionnaires used an ordinal scale of 1 to 5, where 1 corresponded to significantly lower ratings to 10 significantly higher rating. The sample consisted of 335 branches MNC, which is 13.35% of the basic sample. From a sectoral point of view, the most represented MNC affiliates were in the industry section C - Manufacturing (59%), G - Wholesale and retail, repair of motor vehicles (13%), M - Professional, scientific and technical activities (6%) and section J - Information and communication (4%). These sections included 82% of the MNC affiliates.

Brief presentation of the sample shows that the proportion of the size of branches according to the number of employees was as follows: 24.2% from 50 to 99 employees, 39.7% from 100 to 249 employees and 36.1% more than 250 employees. In terms of their legal form, there were 20% of corporations and 80% of companies with limited liability.

Statistical processing of the survey was carried out after the completion of data collection, which was carried out by an external company specializing in collecting questionnaire data (address, data acquisition, processing in the data matrix). Having been checked, the data were recoded and analyzed by the univariate analysis by defining the frequency of occurrence of each response and the arithmetic mean and standard deviation.

3. Results

3.1. The practice of university students in enterprises

If students are interested in optional internship with credit valuation within their field of study, they have to find a specific company where they will be able to work for some time. The interest of students is high; however, a problem arises on the side of companies. Results of the empirical survey show that the interest of businesses to provide students with the experience of business management is limited. The time student has for internship is relatively short - 120 mandatory hours.

During this time the student cannot learn about applying theoretical concepts from economics and management.

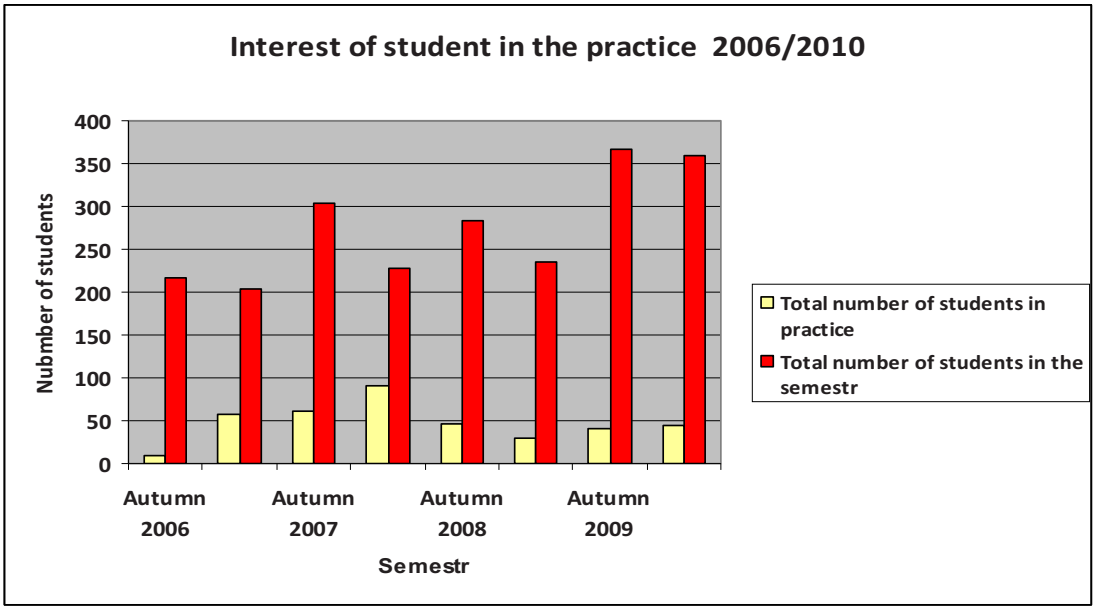

Fig.1:Interest of students in practice

The graph above shows that more than 10% of college students really prepare for work during their study. These are students who choose internship as an optional subject and have agreed on doing it in a specific company. The actual field of specialization at university is connected with the realization of internship. The fields of economics and management are associated with both a strong theoretical background of economics and practically oriented management. This is then reflected in possibilities students of particular disciplines have to ensure the internship and application potential after graduation.

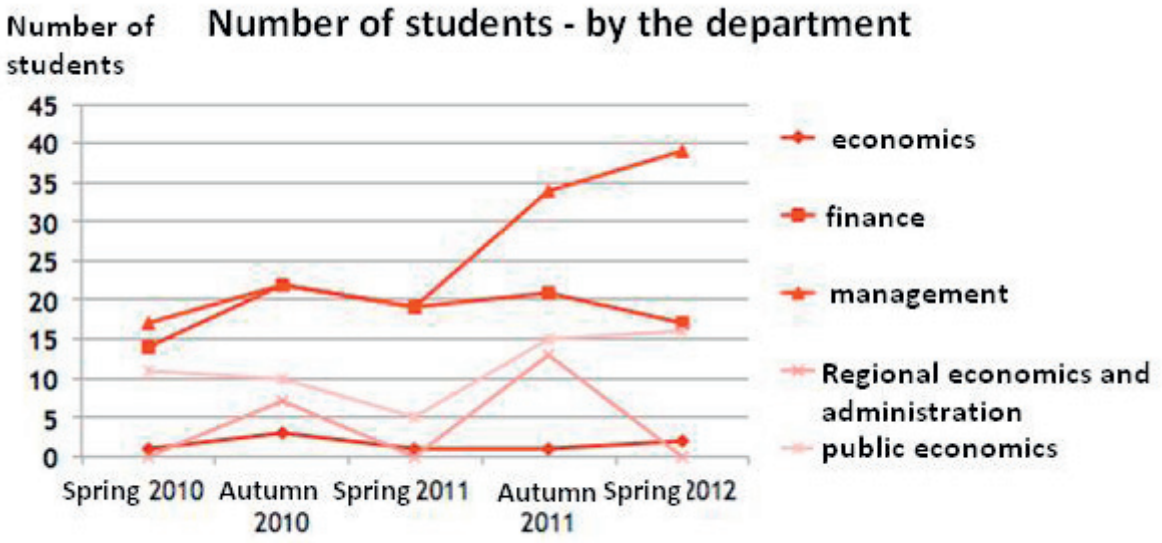

Fig.2: Number of students according the department

Students of disciplines with application potential, i.e. management and finance, are much more represented in the subject of internship. It also significantly associated with greater employability of graduates in these fields. In contrast, students of more theoretical fields, such as economics or public economics, have fewer options because offers of internship in enterprises, government organizations or public authorities are considerably less numerous and their application potential is much more limited. These trends are confirmed at the national level through the monitored indicators of employability of university graduates (Koucký & Bartůšek, 2012).

3.2. Cooperation between universities and the application area – Practice

Within the research of multinational companies in the Czech Republic in 2011, a survey was carried out by Masaryk University on cooperation between the business sector and colleges and universities (Blažek et al., 2011). Enterprises divided by the country of origin, were to identify the intensity of cooperation in the development of knowledge with universities and research institutes. The response range was between 1 to 10 points, where 1 meant no cooperation at all and 10 meant cooperation to a large extent. The question was answered by 331 respondents, which is nearly 99% subsidiaries of multinational companies represented in the file. The average number for each country is shown in the following table and graph.

Table 1. Cooperation intensity divided by the country of origin

Country of origin	Mean	N	Std. Deviation
Australia	3,0000	1	
Belgium	3,0000	12	2,69680
Brazil	5,0000	1	
Czech Republic	6,7143	7	1,70434
Denmark	5,2500	8	3,37004
France	3,8000	10	2,52982
Ireland	2,0000	1	
Italy	3,0000	8	2,77746
Japan	2,0000	9	1,41421
Cyprus	1,0000	2	0,00000
Liechtenstein	4,0000	1	
Luxembourg	3,2308	13	2,52170
Malta	0,0000	2	0,00000
Germany	3,2883	111	2,30961
Netherlands	3,9556	45	2,75479
Panama	1,0000	1	
Poland	3,5000	2	3,53553
Austria	3,5789	38	2,45645
Russia	7,0000	1	

Slovakia	1,5000	6	,83666
Slovenia	9,0000	1	
USA	4,0000	9	2,78388
Spain	3,5833	12	2,46644
Sweden	4,7500	8	2,05287
Switzerland	3,9167	12	2,57464
Great Britain	4,5714	14	2,47182
Total	3,5910	335	2,52827

The research shows that almost 60% of surveyed enterprises rely more on themselves in their innovation activities . Further investigation showed that companies which reported the maximum value of cooperation, i.e. 10, are from the manufacturing industry. A great deal of cooperation, i.e. 7-9 points, was shown by relatively most companies in the section Information and communication activities. It was also found out that the higher the increase in the number of employees in enterprises is, the greater the cooperation is. However, it should be noted that this is a minimum of enterprises from different sectors without representativeness in the surveyed sample of subsidiaries of multinational companies.

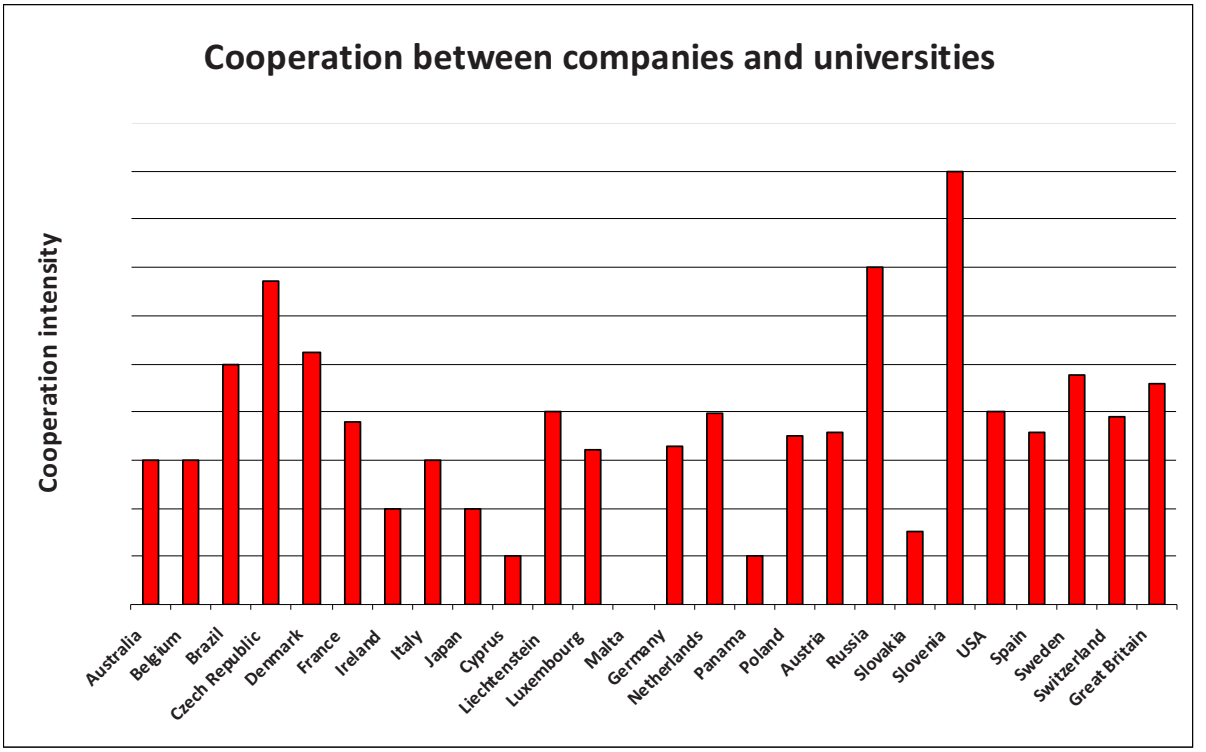

Fig.3: Cooperation between companies and universities 2010

In terms of the share of foreign owner, it shows that companies with an ownership stake of a foreign entity higher than 50% and less than 100% cooperate with external organizations to a lesser extent than companies that are wholly owned by a foreign entity.

Some correlation between the level of gaining knowledge in the context of cooperation with external entities is indicated when companies are analyzed according to their financial performance. It can be said in a very simplified way increasing financial performance means increase in the scope of cooperation with research institutions (Blažek et al., 2011).

The graphs show that the most significant cooperation with a limited proportion of the surveyed branches between the theoretical and the practical sphere, is in companies owned by Slovenian and Russian owners. These are followed by large degree of cooperation carried out by the co-owners from the Czech Republic and Denmark.
On the contrary, cooperation between business and research sector does not take place in enterprises owned by owners from Malta, Cyprus and Panama. What is a very interesting finding is a very low cooperation with the nearest foreign neighbor - Slovakia.

4. Resume

Considering the issue, spending on research and development is a very interesting indicator. Except Liechtenstein, where expenditure on research and development is exceptionally high, the percentage of expenditure on research and development in developed countries is around 3%. Countries like Brazil, Cyprus, Panama, Poland and Slovakia are below 1%. These countries can also be characterized by very low cooperation between universities and branches of multinational companies operating in the country. This suggests that the lack of allocated funds measured by a GDP share on research activities is also reflected in the willingness of cooperation with universities.

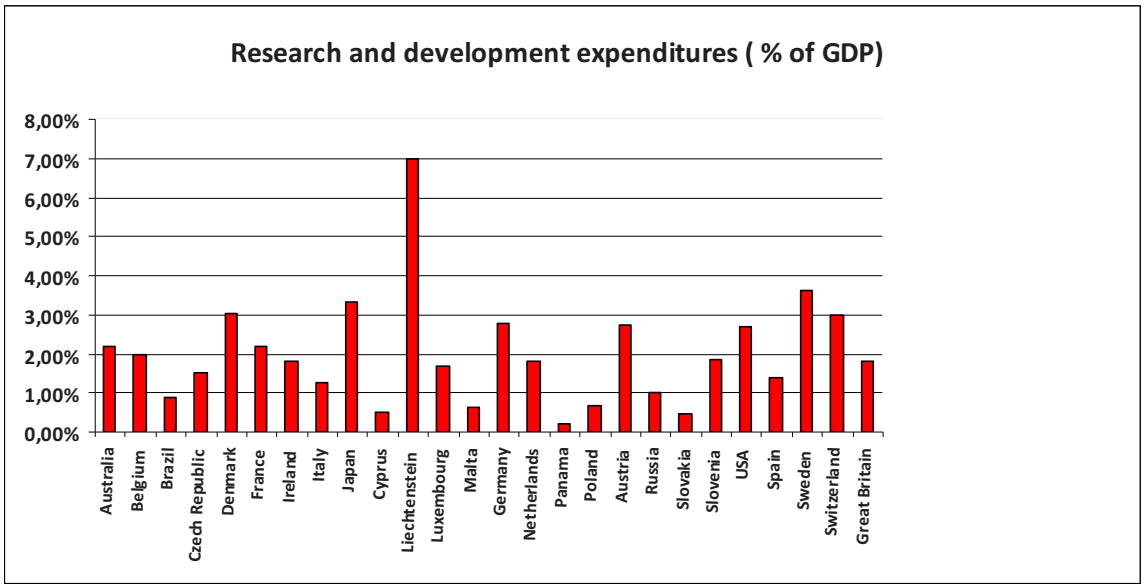

Fig.4: Research and development expenditure 2010 (% of GDP)

Investment in education, enhancing the knowledge and skills of citizens is a competitive advantage that can create new values, flexibility to respond to rapidly changing market needs and generate new ideas. The above mentioned information shows that countries which spend the highest percentage of GDP on research and development are aware of the fact. (Gola, 2012, OECD Factbook, 2011-2012).

5. Discussion

According to the OECD (OECD Factbook 2011-2012), expenditure on research and development is a driving force of national economies. Since 2000, global spending on research and development has been growing. The findings of surveys show that R & D support from the state has an impact on encouraging cooperation between institutions involved in research activities, represented by university, and private firms. The result of the cooperation benefits both parties, consisting in the

development of employees who have the appropriate education and qualifications. An inseparable part is the experience that potential employees - university students gain during their studies.

The often criticized purely theoretical knowledge is slowly becoming a thing of the past. It has been shown that universities are trying to introduce courses focusing on the practical application of theoretical knowledge in their syllabi. In connection with the surveys, it is impossible to find out whether the application sphere is aware of the opportunities offered by at least a partial internship of students. A possible example of a successful link between teaching, practice and cooperation, is the establishment of high school Skoda - Auto, which offers degree programs in engineering and business management processes and management (source: www.savs.cz). Students of this type of schools start work having the advantage of domestic and foreign experience. Unfortunately, the research into collaboration of subsidiaries of multinational companies with universities proved that cooperation with Czech universities and research institutes is minimal. With regard to the number of subsidiaries of multinational companies represented in the empirical survey, it can be concluded that the level of cooperation is below average. The branches of multinational companies interviewed stated that the cooperation does not exist at all - 27.8% (total 92 branches) or only to a limited extent, 31.4% (104 branches). This is particularly noticeable among the largest foreign investors - Germany, where there is a limited cooperation with universities. High intensity of cooperation is shown only by 4 branches of multinational companies. It confirms the findings of the Ministry of Education, Youth and Sports of the absence of functional cooperation platform between application sector and universities. It is based only on formal declaration without significant results demonstrating the effectiveness of cooperation. In the near future, cooperation is expected between research and industry-based financing from public and private sources through indirect support (tax relief) and the purchase of scientific research results by the commercial sector through vouchers from (Czech) public research institutions and universities. The question in light of the findings remains how the declared support will be reflected in greater cooperation between universities and the application area with regard to benefits for all stakeholders.

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